



Vidya Vikas Education Trust's
Universal College Of Engineering
Kaman, Vasai – 401 212
Department of Civil Engineering



The Benchmark

Issue 003: October 2018 Edition

ACES InExCon

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Words of Wisdom

Drishti

It is important to know how long machinery and infrastructure upgrades take to pay off and when their investment in energy efficiency will start to pay dividends.

- Mr. Sudarshan N. Ashan

Drishti

While no structure can be entirely immune to damage from earthquakes, the goal of structure is to erect such type of structures that can provide better results during seismic activity than their conventional method.

- Mr. Miraj Thaker

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Different terms related to accidents were elaborated with emphasis on Road accidents by Vehicle type, Road user category, causes, and measures. He lastly explained 10 golden Rules of safety and ended the seminar with Question Answer sessions.

- Road Safety Awareness

Altitude

In beginning it was very difficult to adapt but slowly it was not a problem. Studying at the global level with the people from almost all round the globe is a different and new experience.

- Mr. Darshik V. Zalawadia

From General Secretary of ACES

Association of Civil Engineering Students (ACES), under The Institution of Engineers (India) (IEI), is the Student Chapter of the Civil Engineering Department which strives to enhance the academic and social environment of students by helping them discover hidden talents within themselves, familiarize them with the latest & recent trends in the field of civil engineering as well as allowing one to mingle with fellow peers and seniors, thus enabling fruitful networking.

“ We have a major inter-collegiate event “Tantrotsav” on 6th October 2018. Since this is a festival of ignited minds, festival of innovative ideas, festival of challenges, we thought why not make this edition rather technical and thought provoking. Hence have we added more number of technical articles under “Drishti”. We have also mentioned a new sub-section in “Drishti” which highlights important news related to environmental and civil related issues. The Road Safety Awareness was a particular highlight in the ending weeks of September. ”

-From Editor's Desk

Drishti

Energy Audit

-by Mr. Sudarshan N. Ashan



About the Author: *Mr. Sudarshan Ashan has completed B.E. in Civil Engineering, PGDMS, M.Tech in Construction Management along with MBA in IT & has also acquired FIV. He is also a Professional Valuer & Fellow of the Institute of Valuers - New Delhi.*

The process of reducing the amount of energy input into a system without affecting the output negatively is termed as Energy Audit. It is an inspection survey and analysis of energy flows, for energy conservation in a building. Everyone is interested in upgrading their homes and facilities, to be more energy efficient and to help them lower the cost of their monthly energy bills. After identifying the sources of energy use, they are prioritized in a descending order of cost effective opportunities for energy savings.

In energy audit, the auditor will examine the energy bills for the last one year, then conduct a room-by-room inspection, examining energy consuming items and areas that could be potential energy wasting objects. Then he calculates current energy usage and proposed savings. Basically the energy audit can be broadly classified as home audit & industrial audit as the consumption pattern, requirements and compulsions are different in them.

Home Energy Audits

A home energy audit focuses on reducing energy costs. It mainly focuses on energy wasting factors such as air leakage, energy consuming factors of heating, lighting, and more. Most of the homes do not meet the current energy efficiency standards and as a result are wasting significant amounts of energy, contributing to global warming. Home energy audit, evaluates energy efficiency of a house and suggest the best ways to improve energy efficiency in heating and cooling the house.

The auditor records the various characteristics of the building envelope including the walls, ceilings, floors, doors, windows, and skylights. The R Value is measured for each of these components. Air infiltration or leakage rate through the building envelope are the main concerns. These factors are strongly affected by window construction and quality of door seals. The audit also assesses the efficiency and physical condition of mechanical systems, like the heating, ventilation, air conditioning equipment, and thermostat.

Other important factors that are to be considered are the local climatic condition, thermostat settings, roof overhang and solar orientation. Some of the greatest effects on energy use are user behaviour, climatic conditions and age of the structure. Hence energy audit should consider the homeowners usage patterns over a period of minimum one year. Recently, the improvement of smartphone technology has enabled homeowners to perform relatively sophisticated energy audits of their own homes.

Commercial Energy Audits

These are designed specifically to assist business owners reduce costs. In this cut throat business competition and economic conditions, businessmen find energy efficiency as a saviour. Terms like Return on Investment (ROI) and Net Present Value (NPV) have a significant importance and are the focal point in decision making. It is important to know how long machinery and infrastructure upgrades take to pay off and when their investment in energy efficiency will start to pay dividends.

Increasingly in the last several decades, industrial energy audits have gained momentum driven by the exorbitant cost, depleting resources and realization of sustainable future. It is more pronounced since energy spending is approximately 10% of the average business expenses in energy intensive processes. Unlike in home audits where weather proofing and insulating are normal solutions, in case of industrial applications the focal point of the audit revolves around the HVAC, lighting, and production equipment that use the most energy.

Success is no mystery, but simply the result of consistently applying some basic principles.

We need to compete for knowledge and wisdom, not for grades.

A Comparative Study Of MSE Wall And RCC Retaining Wall Using Plaxis 2d

-by Mr. Naved Qureshi



About the Author: Mr. Naved Qureshi has completed his B.E. Civil Engineering from Anjuman Islam Kalsekar Technical Campus with final year project topic: "enhancement of physical properties of concrete by using fibre mesh". He is currently pursuing M.tech in Geotechnical Engineering from Parul University.

The present scenario of cities is changing rapidly leading to more advancement of infrastructure facilities. These facilities include surface as well as sub-surface transport system such as monorails, metro, freeways etc. For subsurface transport facilities, challenges faced include present surface development and sewage as well as water supply lines existing below the surface. To address these issues, adequate knowledge of soil condition of the locality is required.

The construction of bridges, culvert and embankment involve soil retention to improve strength of soil. This can be achieved by constructing retaining wall, which has evolved into more stable forms starting from gravity walls to cantilever walls. Further counter fort wall were introduced to increase height of soil to be retained.

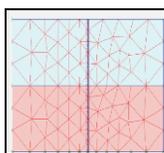
Now days a new technique is emerging for construction of retaining walls known as mechanically stabilized earth wall (MSE). MSE walls are earth retaining walls which can restrain the lateral forces by providing alternative layer of reinforcement behind facing wall, which is compacted with soil to form an integral part to prevent deformation. In many highways, design of mechanically stabilized earth wall system are essential element and they represent retention system of choice more frequently than in the past. MSE Wall system are economical earth retaining structures, which can tolerate more settlement over traditional retaining wall system.

Key benefit of MSE wall

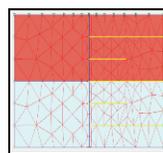
- 1) It improves performance of in-situ soil.
- 2) Minimizes land occupied and therefore results in saving construction cost and time.
- 3) It enhances load carrying capacity in both static and dynamic loading

PLAXIS

Plaxis is a FEM technique based tool, which is used especially for analysis of geotechnical structure .It is a simple tool comprising of a simple graphical procedure, which gives more efficient solution. The enhanced output provides detail result in output window. It also helps in providing the results of meshing of deformed structure. Plaxis provides option to find the soil behavior by constructing various soil models like Mohr-Coulomb's model and advanced soil models.



Mesh generation in retaining wall



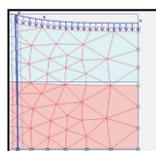
Mesh generation in MSE wall



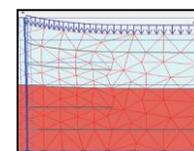
Calculation of retaining wall



Calculation of MSE wall



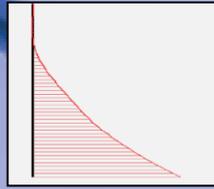
Deformed mesh of retaining wall



Deformed mesh of MSE wall

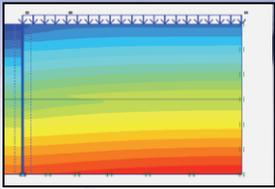


Bending moment
Extreme bending moment -57.15kNm
Max bending moment in retaining walls.

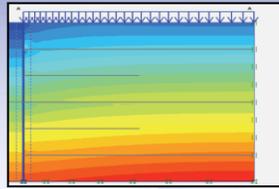


Bending moment
Extreme bending moment -57.61kNm
Max bending moment in MSE WALL.

Fun Fact:
A Dam is nothing but a Retaining wall for water.



Effective stress in retaining wall



Effective stress in MSE wall.

Ability teaches us how we do, motivation determines why we do, and attitude decides how well we do.

Student Achievements

Mr. Yash Tiwari, Mr. Kishan Das & Mr. Sumit Gupta, Final year students, have recently acquired an “IEI R&D Grant-In-Aid” of Rs. 20,000 /- against the topic of their Final Year Project as described below.

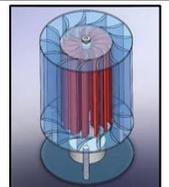
Generation of Electricity using Wind Turbine at median of highway:

Energy conservation is the cheapest new source of energy. The project mainly focusses on generating electricity using wind energy or turbines. The idea proposed is a new technique which uses wind produced by moving vehicle on the road and converting it to electricity. This can be used where the roads are properly divided. Implementation of turbine Mechanism is easy and also cost effective which can be done without disturbing the current road designs and disturbing the traffic.

Wind power is extracted from air flow using wind turbines to produce mechanical or electrical power. This is one of the most recent power generation concepts. This device

converts kinetic energy to electric energy by providing a rotating blade on road. wind turbine used here consist of a semi-circular rotating blade which is connected to a disk

which is further connected to shaft. The wind creates movement in the blades which further transfers movement towards generator through shaft. The energy thus generated can be directly used for lighting highway or can be stored in batteries to be used later.



Examination Dates

Description	I.A.T. – 2	Viva Dates	University Exams
Dates	15 th – 17 th Oct.	27 th Oct. – 5 th Nov.	20 th Nov. onwards

Term-work Submission Dates

- 23/10/2018 – Final Year Project Presentation
- 24/10/2018 – B.E. Civil (7th Sem)
- 25/10/2018 – T.E. Civil (5th Sem)
- 26/10/2018 – S.E. Civil (3th Sem)

Kinematic Bearing Base Isolation System

-by Mr. Miraj Thaker



About the Author: *Mr. Miraj Thaker, from TE, has been appointed as the IIT Campus Ambassador, by IIT Bombay and IIT Gandhinagar. He will be the link between the College and IITs and is the go-to person for all the workshops and events associated with IIT.*

This article describes an experimental and theoretical study of the feasibility of using fiber reinforcement to produce lightweight, low-cost elastomeric isolators for application to housing, schools and other public buildings in highly seismic areas of the developing world. It is assumed to be flexible in extension, but completely without flexure rigidity. The fiber-reinforced isolator is significantly lighter and can be made by a much less labor-intensive manufacturing process.

Earthquake-resistant structures are structures designed to withstand earthquakes. While no structure can be entirely immune to damage from earthquakes, the goal of structure is to erect such type of structures that can provide better results during seismic activity than their conventional method.

According to building codes earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at their location. This means the loss of life can be minimized by preventing collapse of the buildings for rare earthquakes while the loss of functionality should be limited for more frequent ones.

In building branch of industry a new method of increasing of seismic resistant was found out, and it was conditionally called as seismic isolation. Building respond to earthquake ground shaking in different ways. When the forces of the buildings or displacements of the building exceed certain limits, damage is incurred in different forms and to different extends. If a brittle building is designed to respond elasticity with no ductility, it may fail due to ground motion induces a force which is severe than the building strength. On the other hand if the building is designed with ductility, it will be damaged but will be able to weather severe ground shaking without failure. Kinematic bearing base isolation system is groups of vertical floating piles connected through rigid massless caps and subjected to vertically propagating harmonic S- waves. It was invented in Sochi city situated in Krasnodar kai, Russia.

It is a type of pile made up of laminated layers of rubber and steel to provide high axial stiffness and low lateral stiffness.

TECHNICAL DETAILS

1. Kinematic bearings can accommodate movement amplitude up to 80 cm.
2. Kinematic bearings can reduce horizontal accelerations by 0.8 m/sec^2 .
3. Kinematic bearings use fairy little rooms in basement, leaving enough space for parking and other usages.
4. Kinematic bearings do not react with wind

The main aim of presenting this topic is to safeguard the earth prone areas. In India various regions such as Kashmir, Northern and Central Himalayas, North Bihar are the following regions fall in the Zone V.

Since Delhi is the capital of India also falls under the Zone IV which causes severe damages to Structures as well as Habitants. It is the foremost duty of us to take a constructive effort towards this movement.



In Other NEWS

Indonesian Earthquake & Tsunami

-by Ms. Sakshi Singh

About the Author: *Ms. Sakshi Singh, from BE, has won many IIT events & competitions. She is currently holding the post of Lady Representative in Student Council of UCOE and she is currently studying 'Rock Mechanics' as an Elective subject.*

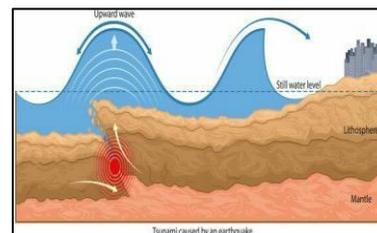
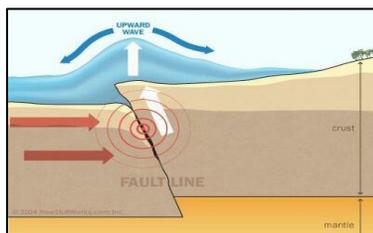


Indonesian earthquake and tsunami is a severe natural disaster that occurred in central Sulawesi island of Indonesia on September 28, 2018. The event began with a powerful earthquake of 7.5 magnitude and initiated a large tsunami waves which was about 3 meter high (10 foot) to surge over the parts of north-western shore, with group of people caught on the coastline, apparently unaware of the danger. The earthquake, struck in the early evening around 6 pm. More than 150 aftershocks followed the 7.5 magnitude earthquake and subsequent tsunami which hit Sulawesi on Friday, causing thousands of homes, hotels, shopping malls and several mosques to collapse. The confirmed death toll from the earthquake and tsunami that struck the Indonesian island of Sulawesi has risen to 832, and the vice-president, Jusuf Kalla, has warned it could reach into the thousands. Scientists expressed surprise at the size of the tsunami that [devastated the Indonesian city of Palu](#) on Friday, saying an earthquake like the one that preceded it would not necessarily spawn such destructive waves. "We expected it might cause a tsunami, just not one that big," said Jason Patton, a geophysicist who works for a consulting firm. Other communities on Sulawesi, including the city of Donggala, were also hit by the tsunami, although there are as yet few details of the destruction or death toll outside of Palu.

The cause of these tsunamis are often the result of so-called mega thrust earthquakes, when huge sections of the Earth's crust are deformed, moving vertically along a fault. This suddenly displaces enormous amounts of water, creating waves that can travel at high speed across ocean basins and cause destruction thousands of miles from the quake's origin. The fault that ruptured on Friday was a so-called strike-slip fault, in which the earth movement is largely horizontal. That kind of movement would not ordinarily create one.

A strike-slip fault might have some amount of vertical motion that could displace seawater. Or the fault's rupture zone, which in this case was estimated to be about 70 miles long, may pass through an area where the seafloor rises or drops off, so that when the fault moves during the quake, it pushes seawater in front of it. Another possibility is that the tsunami was created indirectly. The violent shaking during the quake may have caused an undersea landslide that would have displaced water and created waves. The tsunami could also have been affected by Palu's location at the end of a narrow bay. The coastline and the contours of the bottom of the bay could have focused the wave energy and guided it up the bay, increasing the wave height as it approached shore. Whatever the genesis of the waves, a 7.5-magnitude quake would not be expected to create an ocean-wide event, but rather a more localized one, as was the case on Friday. With the tsunami generated so close to Palu, there was little time for people to escape. A tsunami warning was issued by the government and was lifted about half an hour after the quake, apparently after the tsunami hit Palu.

-by Ms. Sakshi Singh



Seminar on “Road Safety Awareness for Young Drivers”

Introduction:

Seminar on ‘Road Safety Awareness’ was organized by the ACES council in ‘Universal College of Engineering’ on September 24th September, 2018. This Seminar was open to all vehicle drivers in college premises.

Objective: Spreading awareness for road safety among the vehicle drivers in college.

Inaugural Function:

The Inauguration started at 10.00 am. The occasion was graced by the presence of Mr. Shailesh Jahagirdar and Ms. Aarti Gupta from NGO named as ‘Safe Road Foundation’, as the chief guest. The occasion was also graced by Dr. J. B. Patil (Campus Director), Dr. Ajoy Kumar (Principal) and the HOD of Civil Engineering, Mr. Rajesh Dubey of UCOE Campus. The Chief Editor, Mr. Rudra Chauhan, on behalf of the committee and faculty, welcomed all the delegates contributing in the inauguration and the second issue of the newsletter ‘The Benchmark’ was launched by the dignitaries.

Carrying on the introductory presentation was given by Mr. Miraj Thakker explaining the records on no. of accidents, no. of deaths due to accidents, defaults in Indian Road System.

Main Session:

Main awareness presentation was given by Mr. Shailesh Jahagirdar. He kept the current situations of Indian Road and Traffic System in front of all the audience.

He also tried to convey different role on driver’s side. He anyhow convinced the audience that drivers and passengers do face serious loss due to accident. To avoid such incidents, he explained some basic rules drivers must follow. Then the verbal speech on awareness was given by Ms. Aarti Gupta.

At the end of the event, ACES conducted a surprise interactive session in which ACES core member Mr. Ravi Kanojiya asked simple question to students and right answer from students were gifted.

Valedictory Function:

The valedictory function started after the interactive session. The guests in their respective addresses congratulated Universal College of Engineering for the invitation and urged all the council members to continue their activities and contribute their best to the college. Mr. Rajesh Dubey, HOD (Civil Dept.), Universal College of Engineering, proposed the vote of thanks to all the delegates, the organizing committee and teaching and non-teaching staff of Universal College of Engineering for smooth conduct and grand success of the conference. The Program ended with the National Anthem.



Seminar on “Road Safety Awareness for Young Drivers” at VIVA COLLEGE OF DIPLOMA ENGINEERING AND TECHNOLOGY at Virar west.

On 3rd October 2018, ACES conducted seminar on ROAD SAFETY and PREVENTION OF ACCIDENTS at VIVA COLLEGE OF DIPLOMA ENGINEERING AND TECHNOLOGY at Bolinj, Virar west. The seminar was attended by Third year diploma students from Electronics and Telecommunication, Mechanical, Civil, Computers Branch. There were about 90 students from various branches. This Seminar was conducted by Prof. Asir Khan. He showed the Indian Accidental Data, No of Deaths on Road along with graphical representation of Country wise Number of persons killed, Map of India showing Crash Distributions among States/Territories. He also explained Accidents by road category and Road Feature. Different terms related to accidents were elaborated with emphasis on Road accidents by Vehicle type, Road user category, causes, and measures. He lastly explained 10 golden Rules of safety and ended the seminar with Question Answer sessions.



Altitude

Alumni

Alumni are those branches of a tree that have grown thick & bark; although are blooming and flourishing outward from the main bark of the tree (college), they still remain connected and prove to be a continuous testament of everything that is right about the way college is educating & training its students. Here is one such alumnus, **Mr. Darshik Vinod Zalawadia**, and his testament of how UCOE helped him to reach where he is right now.

Just like any autobiography I am describing the most exciting journey of my life which can encourage many of you while it may be just a good article for some to read for. It is all from the days in UCOE to my ongoing Master programme in Construction Management Professional from Deakin University Geelong, Australia. It all started in 2014 when I got enrolled in UCOE in direct 2nd year as I was a diploma student. For the first time when I entered in UCOE I wondered...what jungle I came into? Jokes apart, but seriously for a moment I doubted my decision as UCOE was still in developing stage. But as the engineering journey begun I encountered with the great team of faculties who were expert in their respective fields. In beginning it was bit tough to cope up with but then gradually it went like a super exciting Bollywood movie which has twist, turns, dramas and what not. These includes a daily 50 kms travel daily to UCOE which was not less than any adventure. Secondly, we had number of cultural and technical events like "SOUL of Universal", "VYRO" Tech fest, "Tantrotsav". When it comes to sports we had full two weeks dedicated to the event which was the most memorable part of my journey. The UCOE has enough resources and faculty expertise that would fetch you the solution of any persisting problem. The other exciting part of my journey in UCOE was my final year project, in which we designed Dams on Kaman river. Without immense support of our project guides and civil department the project and this journey wouldn't have been imagined. Ultimately at the end I felt why this journey is getting an end? How worth was surviving in UCOE? At last like



a super hit Bollywood movie it was worth buying a Gold class ticket and experiencing it.

"But picture abhi baki tha mere dost..." While I was in final year I was unsure about my further studies or working, then too I started the preparation for studying overseas. I applied in various Australian universities, as finding a job for a fresh engineer was way too difficult in Mumbai. By the time I got invite form all the universities in which I applied offering scholarships and bursary. My father wanted me to go to US while my Mom didn't want me to leave her nest. We all heard in news channels about incidents occurring in USA and Australia, it was a risky and tough call, but I choose to fly to Australia with my gut feeling. When I started my master programme it was like I entered in a whole new world because education system here is totally different. In beginning it was very difficult to adapt but slowly it was not a problem. Studying at the global level with the people from almost all round the globe is a different and new experience.

After completing my study, I wish to work in Australia to gain an international experience and exposure. If I get opportunity in any other country, then I would grab the break. Then my final desire is to return to India. Sticking to my Gut feeling I took most tough decision of my life and working hard enough to achieve my goals and desires.

- *Darshik Vinod Zalawadia, Civil 2017, UCOE*